

NOTES ON REARING YOUNG CERATODUS.

BY A. RUDEL.

It was my good fortune to receive on December 1st, 1933, through the Queensland Museum, two specimens of the Queensland Lungfish, *Epiceratodus forsteri*, for the purpose of rearing them, if possible, to the adult stage. These fish were hatched out by the late Dr. T. L. Bancroft and were, after his death, sent with a few others to the Museum by his daughter, Dr. Josephine Mackerras. When received the fish were 17 mm. in length. They were hatched out between September 23rd and October 9th, 1933.

After their long journey from Eidsvold, the two small fish seemed in poor condition, and one of them was floating upside down in the container, but a slight touch sent it to the bottom very much alive.

I prepared an all-glass aquarium, size 30 x 9 x 9 cm., in the following manner:—The bottom was covered with well-washed coarse sand to a depth of 50 mm., rising to a height of 120 mm. at one end. I covered the highest part of the floor with smooth pebbles the size of hazel nuts to provide hiding places for the fish. The height of the water was just flush with the highest point, *i.e.* 120 mm.

Out of a few long-established aquaria I siphoned some sediment consisting of decayed vegetable matter, such as aquatic plants and algae and excreta of aquatic snails and fish, which covered the new tank to a depth of about 10–12 mm. This sediment sinks quickly to the bottom and leaves the water quite clear. It contains a host of living organisms. To keep the water pure I planted a few sprigs of *Hydrilla* and *Ceratophyllum demersum*. After making sure that the temperature of the water in the new tank was equal to that in the container, which was 24 Celsius, I transferred the two specimens. Colour of young fish:—blackish above and lighter below. Now the vexed question of feeding presented itself. I did not have the faintest idea what they would eat or what they would require. As I could see by their size that they were past the infusoria stage, I decided to give them a mixed diet and feed them on things with which I generally feed young fry. First of all I placed a lot of mosquito rafts (eggs of *Culex*) in the aquarium; then I strained a quantity of mosquito larvæ through a fine tea strainer and also crushed three or four aquatic snails in the water. After two days I rubbed a few *Enchytræ* worms through a fine strainer. Two days later I rubbed a little shredded raw beef through a fine strainer, giving them a change of diet every second day. Needless to say I took great care not to foul the water, especially as I had placed the tank in a position where the light was only subdued.

After about a month I siphoned half the water out of the tank and renewed with fresh water of the same temperature. The fish lived and I took the first measurements on March 4th, 1934, when they had attained the length of 50 mm. Colour : dark chocolate above and just a shade lighter below.

Now came the time to transfer the fish to a bigger tank and I was dubious as to how they would stand the change. I prepared a tank, size 55 x 30 x 30 cm., well planted with *Hydrilla* and *Vallisneria*, and formed a kind of grotto with some large smooth stones. Height of water 15 cm. The fish stood the change well and disappeared at once among the stones. The new tank also contained the above-mentioned sediment to a depth of about 15 mm. Now I fed them with mosquito wrigglers, Enchytræ worms, finely-shredded raw beef and crushed aquatic snails. When measured on May 25th the fish were 75 mm. The colour then was dark chocolate above and below, with mottled lighter spots, also five distinct black spots on both sides of the tail. The water was raised to full height of aquarium (30 cm.). On July 10th the bigger of the two fish was 103 mm., the other fish was about 10 mm. shorter.

There is not much to write about the behaviour of the fish, as they lead a rather quiet and sedate existence ; they are essentially "bottom feeders" and approach their food with jerky movements. They resemble very much the Mexican Axolotl in their movements, but they move like lightning when touched ; in fact one jumped right out of the aquarium on one occasion. They prefer to rest in the sediment and it is my opinion that a layer of this is of vital importance in rearing *Ceratodus*.

One of the two specimens measured on August 23rd, 1934, was 122 mm., in maximum length.

Another specimen reared from ova obtained from Mr. George Sigg, Drinan, near Bundaberg, Burnett River, attained a length of 156 mm. in the course of twelve months in similar conditions.

Editor's Note.—The two *Ceratodus* were placed in the Bancroft Memorial Aquarium in the Queensland Museum on March 21st, 1935. One was approximately eight inches in length, the other being distinctly shorter. References to Dr. T. L. Bancroft's published work on *Ceratodus* will be found in the paper on Juvenile Lungfishes (Memoirs of the Queensland Museum, Vol. IX, 1928, pp. 160-173).
